

Nelson Questions

5.5 – Cell Division

- 1) What is cytokinesis?
- 2) How do the new cells formed during cell division compare with the initial cell?
- 3) List and describe four phases of mitosis.
- 4) A normal human cell has 46 chromosomes. After the cell has undergone mitosis, how many chromosomes would you expect to find in each cell?

5.8 Reproduction and Cell Division

- 1) How is asexual reproduction different from sexual reproduction?
- 2) Why must the genetic material of the cell be duplicated before cell division begins?
- 3) How is the zygote, produced by sexual reproduction, different from daughter cells, produced by asexual reproduction?
- 4)
 - a. Describe briefly five types of asexual reproduction.
 - b. Choose one type of asexual reproduction. Explain how a plant nursery could make use of it.
- 5) Identify the type of asexual reproduction in each of the following situations:
 - a. A multicellular algae is struck by a wave. The algae breaks up and each new piece grows into a new organism.
 - b. A new tree begins to grow from the root of a nearby tree.
 - c. A small cell begins to grow on the outside of another cell. Eventually, it breaks away from the larger cell and continues to grow.
- 6) What advantages might an organism have that can reproduce asexually?

6.9 Cloning

- 1) What is binary fission?
- 2) How are plants cloned?
- 3) What is an enucleated cell?
- 4) Describe how nuclear transplants are used to clone animals, such as frogs.
- 5) If the nucleus were extracted from a human adult cell and placed into an enucleated egg, how could you distinguish the cloned individual from the original?
- 6) Dolly was not the first cloned animal, nor was she the first mammal clone. What made her cloning special?
- 7) Imagine that farmers were able to easily clone any animal in their herd or flock. What might be the benefits for food production? Would there be any disadvantages? Explain.

7.3 Reproduction in Flowering Plants

- 1) Many plants are hermaphrodites. Explain.
- 2) Name the male and female sex cells of the flower.
- 3) What is pollination? How does it occur?
- 4) Explain how fruit is formed.
- 5) There is no question five.
- 6) Speculate how fruit formation helps plants spread their seeds. Use several different fruits as examples.
- 7) Have you every noticed that hummingbirds are attracted to red trumpet-shaped flowers? The long beak and hovering flight of the hummingbird make it ideally suited for getting nectar from these flowers. In the process, they pollinate the plants. Provide other examples of how flowers and animals have developed special structures to ensure pollination.

7.5 Reproduction of Plants for Food

- 1) Why is increasing food production such a great concern?
- 2) How might grafting and selective breeding help increase food production?
- 3) How do cloning and grafting limit biodiversity?
- 4) Historically, humans have used about 700 different species of plants. Today, we rely heavily on only about 20 species. Why might it be dangerous to reduce the number of plants used by people?
- 5) Many farmers grow a single crop on large areas of farmland. What are the advantages and disadvantages of this practice?

7.6 Sex Cell Development in Males

- 1) What features of the sperm cell make it well suited for movement?
- 2) What are seminiferous tubules?
- 3) Describe the development of the sperm.
- 4) What are the functions of testosterone?
- 5) Describe the differences between mature sperm cells and reproductive cells.
- 6) Why do sperm die only a few days after they are produced?

7.7 Sex Cell Development in Females

- 1) Where are egg cells produced?
- 2) What is the site of fertilization?
- 3) In which structure does the embryo develop?
- 4) What are the two types of follicle cells found in the ovary? Explain the function of each of the cell types.
- 5) Describe ovulation.
- 6) How is the corpus luteum formed? Explain its function.
- 7) If the ovaries of a woman are removed, would she be able to give birth to a baby? Support your answer.
- 8) Ectopic pregnancies occur when the embryo becomes implanted in the oviduct rather than the uterus. Speculate about some of the difficulties that would be experienced by such a pregnancy.